Lonergan's Insight and Threshold Concepts: Students in the Liminal Space

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Introduction

In this article we draw on the work of Bernard Lonergan to argue that the theory of a threshold concept can be augmented by his focus on the understanding of understanding (Lonergan 1992). Lonergan's emphasis on insight is especially useful in allowing us to think through the individual student's role in learning, an area not fully explored by threshold concepts. To this end, Lonergan's conceptualization of the process of coming to understand enables a deeper understanding of how threshold concepts impact on the individual learner. It is here also that Lonergans's attention to error and bias is of value for informing the threshold concept idea of liminal space and the learner's 'stuckness' before passing through a threshold.

The term 'threshold concepts' was first coined by Meyer and Land (2003) and is used to describe those parts of a curriculum which are key to understanding the subject and which students find hard to grasp. They can thus be used in curriculum design and in evaluation of learning as a measure of a student's understanding of the key ideas in the topic studied.

Lonergan's epistemology offers an understanding of the dynamic process of learning and coming to know. It describes a general process of having experiences, reflecting on them, obtaining an insight into the experience and developing a concept, which is then judged as to its veracity. Obtaining an insight often opens up other questions to the learner, which lead to further insights. This only ends when there are no further relevant questions to be asked.

Whereas threshold concepts are static and largely teacher imposed structures in the learning process, insights are, generally, smaller units of understanding, that enable the learner to progress from what they already know towards greater understanding. Insights can therefore provide a cognitional underpinning for the idea of threshold concepts; a unifying understanding of how students approach thresholds, how they can get stuck in the liminal space around a threshold and how individual paths to and through a threshold can vary.

Threshold Concepts

A threshold concept is, in educational terms, a 'portal' that leads to a previously inaccessible way of thinking about something. A new way of understanding emerges,

a transformed view of subject matter or landscape, or even a new world view (Meyer and Land 2005, 373).

Movement through such portals takes the student through transformative, irreversible and integrative changes. The knowledge gained may be troublesome, and the new conceptual space opened up is itself bounded, and leads to other portals (Meyer and Land 2005, 374). Thus, while passage through a portal itself opens up new conceptual space, it also indicates further areas for exploration and learning beyond itself.

The five identified characteristics of threshold concepts (Cousin 2006) are that they are transformative, irreversible, integrative, bounded and include 'troublesome knowledge', that which is counter-intuitive, alien or seemingly incoherent. Grasping a threshold concept transforms our understanding and thus changes us as learners. A threshold concept is also unlikely to be forgotten, although it can be modified. It can also help the learner to make connections between apparently disparate phenomena, integrating separate areas of the subject.

Learning is both affective and cognitive, and the assimilation of troublesome knowledge can unsettle and disconcert the learner. Thus, within the idea of a threshold concept is one of a liminal space, where learners may oscillate between old and new understandings. In this space, students often find learning challenging, and may get 'stuck'. Such regions are the places of misunderstandings and confusion, with oscillation between states of knowledge (Meyer and Land 2005, 374-6). The liminal process has been equated with traveling through a tunnel, through which it can take time to progress. The learner may be 'in the dark' for some or all of the journey, unaware of their direction of travel and progress (Land, Rattray, and Vivian 2014). Not all learners see or reach the light at the end of the tunnel and some may remain in the old understanding, never crossing the threshold and obtaining a deeper understanding of the subject. Others may struggle for a greater or lesser period before passing the threshold and entering into a new and deeper understanding of the subject. Variations between different learners are confined not only to the liminal state but are evident in all stages of the process, namely the sub-liminal (tacit understanding developed in the absence of formal knowledge of the concept), pre-liminal (initial perceptions about the threshold concept, what it 'looks like'), liminal (including entering, being in, progressing through (or not) the liminal state) and post-liminal (from the point of passing through the portal and entering the new conceptual space) (Meyer, Land, and Davis 2008, 67-8; Nicola-Richmond et al. 2017, 6-7).

It can be argued that the criteria for determining thresholds are vague. The five properties of transformative, irreversible, integrative, bounded and troublesome are not presented as necessary conditions for a threshold concept. This makes it very hard to determine exactly what constitutes a threshold concept (Rowbottom 2007, 263-4; Barradell 2013, 267).

A further issue is that grasping a concept does not give one possession of an ability. I may grasp the concept of playing tennis, but if I have never played the game, I am

unlikely to have much practical ability. Similarly, I may grasp the concept of integration in mathematics, but my ability to integrate is lacking until I have solved problems in integration. Learning requires practice. Furthermore, concepts come in groups. An overarching concept can be made up of other concepts, as playing tennis is made up of atomic concepts such as 'line' and 'ball', as well as other complex concepts such as 'serve' (Rowbottom 2007, 266). The idea of playing tennis is, therefore, made up of multiple concepts, both simple and complex, and there is not a single threshold between not being able to play and being able to play the game.

Finally, the idea of a threshold concept as transformative and integrative has been questioned. It can be argued that any concept, once grasped, can be transformative or integrative, but the problem is how to decide which of these are significant. Furthermore, what is transformative for Person A may not be for Person B. For example, a person who has grasped the concept of 'potential wells' is likely to have less trouble with ideas about gravitation than someone without. The threshold is simply in a different place for the two individuals, and is less significant for the first than the second (Rowbottom 2007, 267).

There has been much work on identifying threshold concepts in a wide variety of subjects. For example, atomic structure has been identified as a threshold concept, which has a variety of conceptual barriers, such as probability and quantisation, between the student and the teacher's desired outcome (Park and Light 2008). In economics, opportunity cost has been identified as a threshold concept for first year university students (Shanahan, Foster, and Meyer 2006). Thus, the idea of threshold concepts has taken hold across disciplines. However, it is essential to note that rather than students, it is largely teachers that are responsible for identifying threshold concepts (Barradell 2013, 267). Teachers draw on their experience of having been both teachers and students of a subject to identify concepts which students find difficult to grasp (Scheja and Pettersson 2010, 224).

Threshold concepts are therefore grounded on explicitly empirical observations. A concept is identified by a teacher as being hard to grasp by many students. Alternatively, a teacher regards a given concept to be of significant importance to the subject, such that a learner's failure to understand the concept would impair the ability of that learner to understand the subject as a whole. While acceptable from an empirical point of view, there is no *a priori* reason why such threshold concepts should be found across many areas of scholarship, nor why they should be found to have the same characteristics across subject areas. There is no obvious empirical reason why, for example, the learning of the concept of irony in English Literature studies should have the same cognitive characteristics as learning about atomic structure. Threshold concepts, therefore, while based in empirical observation and constructed in a wide variety of subjects, require some underpinning in human cognitional theory; otherwise they simply collapse into a series of unrelated subject based observations.

Threshold concepts are, more or less, static goals of the learning process. A teacher can observe, note or simply decide that a given concept is of sufficient import to be described as a threshold concept. As noted, this ignores differences between

individuals, and also takes no account of the dynamics of learning, or coming to know. For example, it has been shown that students set the same learning task may, through focusing on different problems, work towards learning different things (Scheja and Pettersson 2010, 229). With regard to teaching practice, the threshold concept can be seen as a portal through which students pass in order to reach understanding but it ignores the observable fact that there may be many paths to the portal, and that each student trajectory may well be different. As highlighted by Scheja and Pettersson, the ways in which students comprehend learning and knowledge, approach their studies and reach a point of understanding, vary greatly (2010, 222). Teaching, therefore, is not a simple task of laying out an accepted path to the portal. It may describe a path or paths to the portal, but it cannot ensure that the student passes along it. Other, no less valid paths to understanding may be available, and it is surely the teacher's task to validate the ones which the student has found (assuming that they do lead to valid understanding) or to persuade and encourage students to persevere in trying to understand when understanding is not forthcoming. Threshold concepts, therefore, while useful to teachers, fail to some extent to describe the actual process of learners learning.

In sum, threshold concepts are attractive for teachers because of their potential role in creating and evaluating curricula. However, threshold concepts may, in terms of exploring the process of learning and defining the thresholds, offer limited substance. Threshold concepts as described above are subject knowledge based, defined by the teacher. The identification and definition of portals appears to suggest that passing through the portal is the only way to learn. They take little account of the individual's process of learning something.

Insight

Bernard Lonergan (1904 – 1984) was a Canadian philosopher and systematic theologian. Philosophically, he was interested in epistemology, specifically in how we, as humans, come to understand something. In his main work, *Insight* (1992), first published in 1957, he develops a dynamic theory of how we come to understand. That is, he does not view learning as an acquisition of something, as a gain in knowledge *per se*, but as a dynamic process of coming to understand, and, as such, a process which itself can be understood by the human agent.

Lonergan offers a cognitive theory of understanding, and invites his reader to thoroughly understand what it is to understand. Teachers cannot learn for the student, and each student has to grasp the intelligible for themselves (Marroum 2004, 520). According to Lonergan *Teaching is principally an encouragement, a help in that development of understanding* (Lonergan 1990, 205).

Assuming that Lonergan's understanding of understanding is correct, we can define the steps of learning or coming to know. Broadly speaking, we have an experience, ask a question about that experience's meaning, obtain a cognitive insight into the meaning, broaden that specific meaning out into a concept, consider whether that

concept is correct or not, and then judge whether it is so (Figure 1). We can then take action depending on our experience-insight-judgment complex.

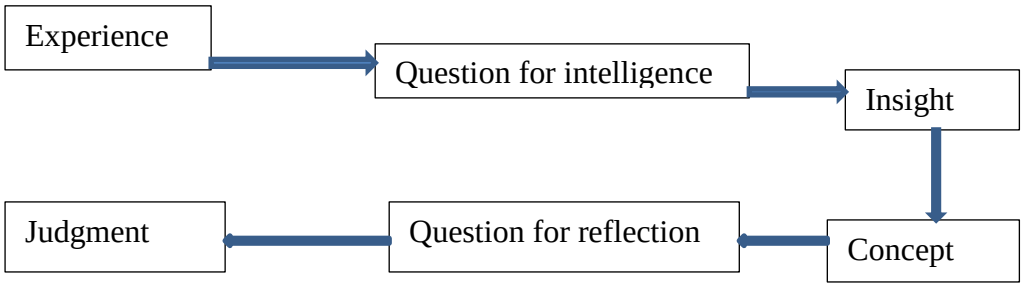

Figure 1: Process of Understanding

The first step, that of experience, is a given in that we all have sense experiences, at least while we are conscious. We then focus on those sense experiences that seem to us interesting or important. Thus, in a learning situation, the student is likely to focus on the experiences presented by the teacher and exclude distractions. Secondly, these experiences upon which we, as learners, focus, draw us into asking questions as to what the experience means. Assuming that the experience was intelligible, questions of meaning will arise as a result of a desire to know.

Once the question has been asked, it is in our mind and we may attempt to answer it and thus gain insight. This process may take several forms, such as conducting experiments, reading other works and puzzling over the question raised. Gaining insight can be hard work (Crowe 2001). The point at which the insight is gained, the point at which we might say the 'penny drops' or the 'clouds part', we understand how this comes to be the case in this context, this set of circumstances. The prime example that Lonergan uses is that of Archimedes, crying 'Eureka!' as he leapt from his bath having obtained an insight into the problem of specific gravity.

The next stage, which automatically presents itself, is that of concept formation. When we try to articulate the insight, we go beyond it, and create a general case, a concept, along the lines of 'in these circumstances, this happens'. The formulation of the concept involves a stripping away of extraneous data from the experience. This leaves us with the important items for the particular learning. Thus, in considering a circle, its colour is not important, while the constant distance of the line from a central point is. There is therefore a distinction between the contents of the concept and the contents of the insight. The concept is an abstraction of the important data from the insight. A concept is, in effect, a definition of something (Lonergan 1990, 43).

Having obtained the concept we begin to reflect on it asking the question 'is it so?' This is a matter of judgment, of making a personal commitment to the fact that it is, or is not, so. This is also rational, a matter of weighing the evidence to hand (Lonergan 1990, 125). The level of commitment can vary, from 'it is so' to 'it is probably so', or, 'it is not so', and also depends on past judgments. Our personal knowledge is mediated by the context of all judgments we have made, which can clarify, modify or affirm our present judgment.

In its simplest form, a judgment is what Lonergan calls a 'virtually unconditioned'. The conditional 'If A then B' has its antecedent affirmed, as we judge A to be the case. Thus we obtain the virtually unconditioned 'If A then B'; if there is an A, there has to be a B (Lonergan 1992, 305-6). Note, however, that this is not a formally unconditioned judgment. It is subject to modification. More information, more insights can accumulate to undermine the virtually unconditioned and persuade us to modify our judgment.

Once obtained, the insight, generalised by the concept related to it and confirmed by reflection and judgment, becomes part of our knowledge, and thus part of the context of all judgments we have made; the personal judgmental context in which all future experiences are examined. The process of gaining an insight as outlined by Lonergan is thus highly personal, to the point that even if two people have the same initial experience, their focus, questions, insights, concepts and judgments are formed in their individual contexts and their insights will not be exactly the same.

Insights are interconnected and can occur in clusters. One judgment may lead to another experience, which itself culminates in a judgment, and so on. In fact, all our experiences may be described as consisting of insight bundles, with experiences, understandings and judgments happening faster than we may be aware of. Of course, there are other instances when we are puzzled by something and have to work it out, in some cases bit by bit, gaining insights into the parts until we have mastered the whole.

Insights can also be inverse, in the sense that we can become aware that there is nothing further to be learnt in a given situation. Inverse insights are not incorrect insights which may be corrected later; they are insights which, in providing limits, often simplify and aid the understanding. For example, in Aristotelian physics, there were difficulties in explaining how constant velocity was maintained. Newton's first law of motion is such that constant velocity is no longer a problem; all the issues now arise from changes in velocity, understood as forces acting and accelerations. Newton's first law thus indicates that there is nothing further to be learnt from a consideration of constant velocities, and thus counts as an inverse insight into mechanics (Lonergan 1990, 56-7).

Insights can also be wrong. In such cases, the judgment question, 'is it so?' has been answered incorrectly. It might be as simple as answering 'it is so' to something that is not, or giving conditional acceptance to something that is, in fact, the case. However, within the dynamic understanding of the obtaining and judging of insights, these errors are usually quickly detected and corrected. It is here that the dynamic structure of knowing comes to the fore. An error is correctable, through further experience, insight, concept creation and judgment. Of course, skillful teaching can minimise the quantity of errors introduced and, thus, speed up the process of learning.

Deeper errors can also be made, however. These errors may arise through an unconscious process, perhaps of bias or repression which can cause us to reject otherwise valid insights, or they can be rationalised away. Attempts to ignore or

marginalise errors and biases can, however, cause crises in the mind and cause the learner to shift to and from sounder viewpoints and to oscillate between what appears to be nonsense and what appears to be truth. For example, a student may understand the Bohr 'planetary' model of the atom. They may then be introduced to the full quantum mechanical model of the atom, but find that this is more complex and less intuitive than the old knowledge they had prior to the learning experience. Working on this new model, then, can cause the student to oscillate between the old, less accurate understanding and the new. The bias towards the old, understood model causes the shift to and from the new understanding (Marroum 2004, 534).

Rather than causing a single point of failure in understanding, such biases have multiple effects. Excluding an insight excludes also the questions that could have followed, and also generates misunderstanding in ourselves and, possibly, in others. For example, a bias in a teacher can have profound impact on the learners they teach. Bias in learners can lead to them becoming isolated and unable to understand the tested insights of others and to accept criticism of their own (flawed) insights (Lonergan 1992, 214-5). This may result in the learner becoming withdrawn into a world which is as they would like it to be, not as it is.

Lonergan distinguishes between common sense and theory based insight and knowledge. Common sense knowledge is grounded in the concrete situation; and is not applied separately from the real world situation in which it is acquired. The observer relates the world to his or her-self. In contrast, theory is abstract and concerned with how things relate to each other. The observer is less present and observations are more theory laden (Marroum 2004, 533-4).

The move from common sense to theoretical knowledge is one which can be difficult for a learner. We are used to relating objects to ourselves, for example catching a ball, rather than analysing the direction and momentum of an object in the air. We start from the common sense level, and moving to the theoretical is hard work. Old knowledge is more comfortable than new. The Bohr planetary model of the atom is preferred to more accurate, but less intelligible, descriptions (Marroum 2004, 534). Theory is often counter-intuitive and, when education is constructivist, often older models are preferred to the newer as being easier and more intuitive.

Insight & Threshold Concepts

Insight, and the model of cognitive development it proposes, allows us to view the learning process as a dynamic, personal one, and it is here proposed that this can serve to elucidate some of the static and hard to define aspects of threshold concepts, as well as serving to prompt revaluation of the teacher's role.

The theory of threshold concepts is useful for teachers as it enables them to identify those areas where the obtaining of insights by students is the most difficult, or those areas where the insights are densest and the need for insights as an on-going process is highest. This makes identifying threshold concepts very useful in curriculum design

and defining learning outcomes (Land et al. 2005). However, both the definition of threshold concepts and the process by which they are found in real teaching situations, is unclear (Barradell 2013, 267). The teacher might draw on their own experience but given the time that may have passed since they crossed through the portal and the challenge of recalling a process that as a learner they had no need to remember, the memory may be limited (Land, Rattray, and Vivian 2014). This can be supplemented by the teacher's knowledge of the process by which the majority of learners move towards understanding to identify threshold concepts but in so doing fails to take account of the fact that individual intellectual processes vary, in that one person's perception of a subject, or area of troublesome knowledge, is not necessarily another's.

This can be addressed by moving the focus from a position of identifying a single moment of understanding (the crossing of a threshold), to, instead, recognising the potential for multiple and varied insights. For the learner, the passage of a teacher-defined threshold concept is comprised of very much smaller units of insights, which may join together to provide a larger one which can be described as a threshold concept. In this model, the role of the teacher becomes less directive and more supportive, in that they provide the circumstances in which the student reaches the point of having an insight or insights. In other words, each insight that occurs for a learner can be regarded as a step towards the overall concept as defined by the teacher.

Even though teaching should be aimed at encouraging the learner to move into the area of the threshold concept, the teacher cannot make the learner proceed along their preferred path. The learner, depending on their own previous experience and cognitive processes, finds their own path to the concept. Lonergan's understanding of human cognitive process explicates this by adding the learner's previous experience to the threshold concept. Hence, as no two learners will have similar insight bundles to compare a new experience with, their path to the threshold concept will not be the same. As Rowbottom (2007) noted, different people proceed by different paths to the transformation of learning.

The teacher can provide the experiences and questions for understanding, but the student has their own insights (Daly 1991). Similarly, post insight, the teacher and student can collaborate on defining the concept and the questions for reflection, but only the student can articulate their own concepts and make their own judgments. The threshold concept is one held by the teacher. A learner, approaching the threshold concept, may not be aware of their attempts to get to it, their liminal difficulties and ultimate success in passing it. In turn, the series of insights that a learner may obtain in approaching it and passing through are not accessible to the teacher, and the threshold concept is not that upon which the learner focusses. Rather, the learner focusses on the sequence of experiences, insights, concepts and judgments that the learning situation provides.

In threshold concepts, the 'liminal space' is seen as a wilderness experience, as a student attempts to determine a route through the portal. Through Lonergan's work

we can gain a fuller understanding of the process in which the learner is engaged in the liminal space. In contrast to the theory of threshold concepts which proposes a single, discrete moment of understanding, a single concept to be grasped, insight suggests that there are many steps to achieving knowing, and that insights join together in a continuing chain of 'coming to know', which we may call learning. The liminal space can therefore be equated with the period when the student is obtaining insights, most of which are discarded, and a few of which enable them, incrementally, to approach the threshold of understanding. Each accepted insight is a step along the way of grasping a whole concept. This process may, indeed, be extended and troublesome, but passage through a threshold portal should not be seen as a single process, but one consisting of smaller steps. Just as Archimedes, doubtless, knew all there was to know in the Greek world about specific gravity when he came to his bath interrupting conclusion, the passage of a threshold concept is contextualised in the process of learning a subject, and thus, of all the smaller insights that the learner has obtained.

The experience of getting 'stuck' in the liminal space, prior to crossing the threshold, if viewed in conjunction with Lonergan's dynamic concept of learning, can be interpreted as a reluctance or inability of the learner to move from common sense or old knowledge to theoretical or new knowledge. As each insight is judged in the context of the bundles of insights the learner has experienced and judged up to that point, a radically new idea or concept can be rejected or treated with great caution, rather than being simply accepted. The oscillation of the learner between new and old understanding identified in threshold concept theory can therefore be equated with Lonergan's account of the process of moving from common sense understanding, or at least the familiar and understood one, to the theoretical one (or the new theory).

Lonergan also provides a view of how errors may arise, by simple mistakes or more complex bias, and how these problems can be addressed. Simple errors of judgment are addressed by supplying the material for more insights; ultimately the process will be self-correcting and the learner will obtain the understanding they seek, if they persevere. Biases are more difficult to tackle, but it is possible given that we are made uncomfortable in the process of dismissing a perfectly good insight because it does not agree with our biases. Attending to this sense of discomfort can lead the learner towards a correction (or at least, the beginnings of a correction) of their bias.

In terms of meeting some of the criticisms that have been levelled at threshold concepts (Rowbottom 2007), the application of Lonergan's insight theory for understanding dynamic cognitive processes supplies some of the missing underpinnings. The most significant of these is that insight supplies a unifying understanding of exactly what a threshold concept is, in that it can be described as an insight or series of insights which a learner has on the way to grasping a major concept in a given subject. The content of the concept is not, here, important, as insight provides a general cognitive understanding thereof. Thus we can see that disparate threshold concepts might all be related by a similar learning pattern. Hence, even though the details of coming to know might be different for different learners and for

different disciplines, the underlying pattern is such that it provides a cohesive threshold concept framework.

Conclusion

Threshold concepts in teaching can be refined and refocused on the learner by the addition of the ideas of insight derived from the epistemological dynamic cognitive analysis of Bernard Lonergan. Lonergan's work provides a cognitive underpinning for the otherwise widely diverse threshold concepts that have been defined in disparate subject areas. Further, the threshold concept themes of liminality and stuckness can be analysed in more detail by applying Lonergan's method and understanding of errors and biases to the approach of a learner to a threshold concept.

The application of Lonergan's method is not intended to replace the idea of threshold concepts, but provide an understanding of how learners learn and come to understand. This view is complementary to the threshold concept approach, which can be regarded as 'top down' or teacher led. Lonergan's account provides more detail about how learners with different backgrounds can approach a given topic or threshold concept in a subject from different places and, thus, why one might struggle to pass the threshold while another might barely notice it.

While Lonergan's cognitive theory refocuses the process of learning on the learner, the teacher is not devalued or ignored. Lonergan starts with experience, the experience of the learner which is the basic material for reflection and insight. This experience has to come from somewhere, and that material is shaped and directed by the teacher. Thus, threshold concepts are useful for curriculum and course design. A subject expert can design a course having identified, from their own experience and insight complexes, those ideas which form a particular subject or module threshold concept set. The more top down process of threshold concept definition thus complements the learner-focused insight cognitive process.

The responsibility of the teacher, therefore, is to understand the cognitive location of their learners and hone their teaching material to the insight complexes which previous experience has provided their students. While this will, of course, vary greatly, often the teacher will be aware of the locations from which their students are, mostly, starting from. The responsibility of the teacher is thus to provide routes from the learner's initial locations to pass through the teacher defined threshold concepts.

In conclusion, the dynamic cognitive understanding of understanding proposed by Lonergan can be used to underpin the idea of threshold concepts in education. Lonergan's insight process provides an understanding of how threshold concepts can be identified across differing subjects, and also reintroduces the individual learner to the activity of thinking about learning. Insight therefore complements and deepens the idea of threshold concepts and we suggest that it is helpful to consider them together.

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